**Ansanm Project 2: Light for Adult Classes and Clean Water**

**1. Briefly describe your project and its objective:**

The Harding University Engineering and Professional Counseling departments have partnered with the Peltan Christian Primary School in Peltan, Haiti in a partnership called Ansanm, which means “together” in Haitian Creole. The goal of the partnership is to provide counseling for the primary school’s teachers, engineering solutions for the school’s needs, and learning opportunities for the university students.

The proposed project for this grant is the design, construction, and testing of an electricity generating system designed by engineering students, to provide lights for the school in Haiti for adult vocational classes at night. A secondary component of this project is a water purification system to be implemented first on a pump previously designed and built by engineering students at the university’s African simulated village, with the expectation of later duplicating the design at the Haitian school. There it would be used to purify water from the existing well there, which uses a mechanical pump designed by the university’s engineering students and was dug by these students as well as local Haitians in May 2011.

The electricity would likely be provided by solar panels or some sort of mechanical electricity generator as determined by the team members analyzing cost and cultural factors. Security is also a concern due to how little electricity is available in the area. Thus a primary focus will be on designing the system to be secured in a theft-deterring way. The products would be designed and tested at the university and implemented on a trip there in May, 2012.

**2. How will your project be accomplished? (describe methodology):**

Using the engineering design process, student team members will research and identify the needs of the Haitian school more clearly to develop requirements and plan the project in more detail. Then, with more research, the team members will investigate potential solutions and choose one to implement. Finally, the designs will be tested to make sure they work as expected. A trip to Haiti is planned for May, 2012 after the completion of the Spring semester to implement the lighting plan. The water purification design will be implemented on with the pump in the African simulated village on university property sometime in the spring semester, and may also be duplicated in Haiti during the trip or on a later trip as determined by the needs of the Haitian school. Installation of the systems will involve the engineering students who worked on the design, local Haitians, and possibly counseling students from the university who may join the engineering students on the trip. The local Haitians will be intentionally involved in the installation process in order that they may become familiar with the system so they can sustain it after the students have left.

**3. Who will be your target audience/customer?:**

The target audience includes people of developing countries such as Haiti, without electricity and who have needs for clean water and lighting for learning. The specific customer will be the school in Peltan, Haiti, where the lighting and water purification systems will be installed.

**4. What are the benefits of your project and for whom?:**

Two main groups can benefit from this project. First, the student team members will experience the engineering design process in a real-world project that has a possible global impact and real customers, which is different from most engineering class projects. This project will allow the students to serve others with their engineering skills in a significant way while learning to work with technology in the context of another culture. They will also have an opportunity to build leadership, critical thinking, teamwork, and communication skills that will help them be effective engineers in their careers.

The other main benefactors are the people of Haiti, specifically those connected with the Peltan Christian School. One goal of the project is to provide lighting so that they can begin adult classes for those wanting to learn skills they can use to get jobs and make a sustainable income. Another goal is to purify the water from their well so that the school’s students have easy access to clean water. In the future, this project could be expanded to provide clean water to the community by expanding the well’s size and pump capacity. Overall, this project could help provide the Haitians with the tools they need to have an opportunity to improve their quality of life.

Secondary benefactors include the newly chartered (Summer 2011) SWE section at the university and the ASME section at the university. With three or more members of the new SWE section (consisting of under fifteen members total) already involved in the project, it could increase the awareness of SWE at the university as well as the strength of the section.

**5. Describe how the project will be measured/ evaluated:**

The checkpoints to measure the progress of the project will be the general steps of the engineering design process, with the team being assessed by the deliverables at each step. The following summarizes the checkpoints and deliverables being assessed:

Problem Identification – Project Charter

Specification Development – Specifications Document

Conceptual Design – The Conceptual Design

Detailed Design – The Detailed Design

Production Phase – Product Demonstration

* Final Presentation

Service/ Maintenance - Final Written and Reflections Reports

At this point, the semester will conclude and the academic requirements of the project will be complete. However, the project will then be implemented in Haiti for use by real customers, bringing the team back to the production phase. Because the team sees the importance of a cradle-to-grave approach to engineering projects, the project will be developed to be sustainable by the Haitian people, and it is expected that future student teams will be involved in any future service, maintenance, and expansion, as well as the final retirement or redesign of the system when needs change over time.

**6. Provide in detail and activity plan and projected timetable for the project:**

An estimated schedule of the project:

* Fall 2011: Begin Research of Haitian School’s Needs
* November 2011: Develop Project Charter
* Early January 2012: Develop Specifications Document
* Early February 2012: Conceptual Design
* Late February to Early March 2012: Detailed Design
* March 2012 to Early April 2012: Product Construction
* Mid. April 2012: Product Test
* Early May 2012: Final Report and Presentation
* Mid-Late May 2012: Trip to Haiti for Implementation of Design

**7. Provide a detailed budget plan for the project; include other funding sources being considered, total for the project, total being requested from ASME:**

Each student participating in the trip to Haiti is required to raise money via fundraising to help cover travel expenses. The university and private sources will provide any other travel expenses as well as other non-expendable equipment. Funds requested from the DAG program will cover expendable materials required for the project as follows:

Electricity Generation and Lighting

Electricity generator ( solar panel is probable method, other generating options being considered)

Inverter

Controller

Wiring

Light fixtures

Light bulbs (type to be determined)

Water purification system

Piping

Water Storage Facility (tank/ water tower is probable)

Actual Purification (method to be determined)

**8. List all partnering groups/organizations that will participate in carrying out this project:**

Harding University

SWE section involvement

ASME section involvement

Engineering Service class

Christian primary school in Peltan, Haiti

Ansanm partnership

Local businesses- help with providing fundraising opportunities for participating students.